

SEQUENCE LISTING

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Arg Thr Lys Arg Ser Ser Thr Thr Lys Leu Tyr Leu Ala Lys Gln Val
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Leu Thr Glu Asp Ser Gly Gln Ala Thr Val Pro Ala Val Arg Tyr Thr	
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Asn Pro Ser Leu Tyr Leu Gly Thr Trp Leu Leu Val Leu Leu Ile Gln	
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Tyr Ser Arg Gln Trp Cys Val Gln Lys Asn Ser Trp Phe Leu Ser Leu	
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Ile Arg Thr Leu Leu Gln Gly Asp Asn Ser Asn Leu Ala Tyr Ser Cys	
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Ser Phe Leu Ser Ser Ile Thr Tyr Ser Trp Tyr Asp Ser Ile Ile Leu	
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cac His 440	atg Met	ctg Leu	tgg Trp	tca Ser	agt Ser	gtt Val 445	cta Leu	cag Gln	att Ile	gtc Val	tta Leu	tct Ser	atc Ile	ttc Phe	ttc Phe	1399
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cct Pro	tca Ser	ttc Phe	aga Arg	gac Asp	caa Gln	gta Val	caa Gln	aac Asn	ctc Leu	cgg Arg	aag Lys	aaa Lys	gag Glu	ctc Leu	aag Lys	1639

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Cys	Asn	Phe	Asp	Lys	Ala	Met	Gln	Phe	Ser	Glu	Ala	Ser	Phe	Thr	Trp	
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Ser	Leu	Ile	Ser	Ala	Met	Leu	Gly	Glu	Met	Glu	Asn	Val	His	Gly	His	
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Ile	Thr	Ile	Lys	Gly	Thr	Thr	Ala	Tyr	Val	Pro	Gln	Gln	Ser	Trp	Ile	
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Gln	Asn	Gly	Thr	Ile	Lys	Asp	Asn	Ile	Leu	Phe	Gly	Thr	Glu	Phe	Asn	
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gaa	aag	agg	tac	cag	caa	gta	ctg	gag	gcc	tgt	gct	ctc	ctc	cca	gac	2263
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Trp Leu Ser Ala Trp Thr Ser Asp Ser Lys Ile Phe Asn Ser Thr Asp	
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Tyr Pro Ala Ser Gln Arg Asp Met Arg Val Gly Val Tyr Gly Ala Leu	
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Phe Gly Phe Val His Ala Ser Asn Ile Leu His Lys Gln Leu Leu Asn	
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Ile Gln Asn Glu Phe Ala His Cys Thr Val Ile Thr Ile Ala His Arg			
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Thr Lys Phe			
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Asp	Ser	Pro	Glu	Ala	Asp	Leu	Pro	Leu	Cys	Phe	Glu	Gln	Thr	Val	Leu
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Val	Trp	Ile	Pro	Leu	Gly	Phe	Leu	Trp	Leu	Leu	Ala	Pro	Trp	Gln	Leu
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Leu	His	Val	Tyr	Lys	Ser	Arg	Thr	Lys	Arg	Ser	Ser	Thr	Thr	Lys	Leu
	50					55				60					
Tyr	Leu	Ala	Lys	Gln	Val	Phe	Val	Gly	Phe	Leu	Leu	Ile	Leu	Ala	Ala
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Ile	Glu	Leu	Ala	Leu	Val	Leu	Thr	Glu	Asp	Ser	Gly	Gln	Ala	Thr	Val
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Pro	Ala	Val	Arg	Tyr	Thr	Asn	Pro	Ser	Leu	Tyr	Leu	Gly	Thr	Trp	Leu
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Leu	Val	Leu	Leu	Ile	Gln	Tyr	Ser	Arg	Gln	Trp	Cys	Val	Gln	Lys	Asn	
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Ser	Trp	Phe	Leu	Ser	Leu	Phe	Trp	Ile	Leu	Ser	Ile	Leu	Cys	Gly	Thr	
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Phe	Gln	Phe	Gln	Thr	Leu	Ile	Arg	Thr	Leu	Leu	Gln	Gly	Asp	Asn	Ser	
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Leu	Ile	Leu	Ile	Phe	Ser	Ala	Phe	Ser	Glu	Asn	Asn	Glu	Ser	Ser	Asn	
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Tyr	Asp	Ser	Ile	Ile	Leu	Lys	Gly	Tyr	Lys	Arg	Pro	Leu	Thr	Leu	Glu	
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Asp	Val	Trp	Glu	Val	Asp	Glu	Glu	Met	Lys	Thr	Lys	Thr	Leu	Val	Ser	
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Lys	Phe	Glu	Thr	His	Met	Lys	Arg	Glu	Leu	Gln	Lys	Ala	Arg	Arg	Ala	
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Leu	Pro	Gly	Leu	Asn	Lys	Asn	Gln	Ser	Gln	Ser	Gln	Asp	Ala	Leu	Val	
		275					280					285				
Leu	Glu	Asp	Val	Glu	Lys	Lys	Lys	Lys	Lys	Ser	Gly	Thr	Lys	Lys	Asp	
	290					295					300					
Val	Pro	Lys	Ser	Trp	Leu	Met	Lys	Ala	Leu	Phe	Lys	Thr	Phe	Tyr	Met	
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Val	Leu	Leu	Lys	Ser	Phe	Leu	Leu	Lys	Leu	Val	Asn	Asp	Ile	Phe	Thr	
				325					330					335		
Phe	Val	Ser	Pro	Gln	Leu	Leu	Lys	Leu	Leu	Ile	Ser	Phe	Ala	Ser	Asp	
			340					345					350			
Arg	Asp	Thr	Tyr	Leu	Trp	Ile	Gly	Tyr	Leu	Cys	Ala	Ile	Leu	Leu	Phe	
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Thr	Ala	Ala	Leu	Ile	Gln	Ser	Phe	Cys	Leu	Gln	Cys	Tyr	Phe	Gln	Leu	
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Cys	Phe	Lys	Leu	Gly	Val	Lys	Val	Arg	Thr	Ala	Ile	Met	Ala	Ser	Val	
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Tyr	Lys	Lys	Ala	Leu	Thr	Leu	Ser	Asn	Leu	Ala	Arg	Lys	Glu	Tyr	Thr	
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Asp	Val	Thr	Asn	Phe	Met	His	Met	Leu	Trp	Ser	Ser	Val	Leu	Gln	Ile	
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Val	Leu	Ser	Ile	Phe	Phe	Leu	Trp	Arg	Glu	Leu	Gly	Pro	Ser	Val	Leu	
	450					455					460					
Ala	Gly	Val	Gly	Val	Met	Val	Leu	Val	Ile	Pro	Ile	Asn	Ala	Ile	Leu	
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Ser	Thr	Lys	Ser	Lys	Thr	Ile	Gln	Val	Lys	Asn	Met	Lys	Asn	Lys	Asp	
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Lys	Arg	Leu	Lys	Ile	Met	Asn	Glu	Ile	Leu	Ser	Gly	Ile	Lys	Ile	Leu	
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Lys	Tyr	Phe	Ala	Trp	Glu	Pro	Ser	Phe	Arg	Asp	Gln	Val	Gln	Asn	Leu	
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Arg	Lys	Lys	Glu	Leu	Lys	Asn	Leu	Leu	Ala	Phe	Ser	Gln	Leu	Gln	Cys	
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Val	Val	Ile	Phe	Val	Phe	Gln	Leu	Thr	Pro	Val	Leu	Val	Ser	Val	Val	
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Thr	Phe	Ser	Val	Tyr	Val	Leu	Val	Asp	Ser	Asn	Asn	Ile	Leu	Asp	Ala	

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Gln	Lys	Ala	Phe	Thr	Ser	Ile	Thr	Leu	Phe	Asn	Ile	Leu	Arg	Phe	Pro	
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Leu	Ser	Met	Leu	Pro	Met	Met	Ile	Ser	Ser	Met	Leu	Gln	Ala	Ser	Val	
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Ser	Thr	Glu	Arg	Leu	Glu	Lys	Tyr	Leu	Gly	Gly	Asp	Asp	Leu	Asp	Thr	
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Ser	Ala	Ile	Arg	His	Asp	Cys	Asn	Phe	Asp	Lys	Ala	Met	Gln	Phe	Ser	
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Glu	Ala	Ser	Phe	Thr	Trp	Glu	His	Asp	Ser	Glu	Ala	Thr	Val	Arg	Asp	
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Val	Asn	Leu	Asp	Ile	Met	Ala	Gly	Gln	Leu	Val	Ala	Val	Ile	Gly	Pro	
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Glu	Asn	Val	His	Gly	His	Ile	Thr	Ile	Lys	Gly	Thr	Thr	Ala	Tyr	Val	
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Pro	Gln	Gln	Ser	Trp	Ile	Gln	Asn	Gly	Thr	Ile	Lys	Asp	Asn	Ile	Leu	
705					710						715				720	
Phe	Gly	Thr	Glu	Phe	Asn	Glu	Lys	Arg	Tyr	Gln	Gln	Val	Leu	Glu	Ala	
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Cys	Ala	Leu	Leu	Pro	Asp	Leu	Glu	Met	Leu	Pro	Gly	Gly	Asp	Leu	Ala	
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		755					760					765				
Ile	Ser	Leu	Ala	Arg	Ala	Thr	Tyr	Gln	Asn	Leu	Asp	Ile	Tyr	Leu	Leu	
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785					790					795					800	
Asn	Lys	Val	Leu	Gly	Pro	Asn	Gly	Leu	Leu	Lys	Gly	Lys	Thr	Arg	Leu	
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Leu	Val	Thr	His	Ser	Met	His	Phe	Leu	Pro	Gln	Val	Asp	Glu	Ile	Val	
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Glu	Asp	Asp	Asp	Tyr	Gly	Leu	Ile	Ser	Ser	Val	Glu	Glu	Ile	Pro	Glu	
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Leu	Ser	Arg	Ser	Ser	Arg	Ser	Asn	Gly	Arg	His	Leu	Lys	Ser	Leu	Arg	
		915					920					925				
Asn	Ser	Leu	Lys	Thr	Arg	Asn	Val	Asn	Ser	Leu	Lys	Glu	Asp	Glu	Glu	
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Leu	Val	Lys	Gly	Gln	Lys	Leu	Ile	Lys	Lys	Glu	Phe	Ile	Glu	Thr	Gly	
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Lys	Val	Lys	Phe	Ser	Ile	Tyr	Leu	Glu	Tyr	Leu	Gln	Ala	Ile	Gly	Leu	
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Phe	Ser	Ile	Phe	Phe	Ile	Ile	Leu	Ala	Phe	Val	Met	Asn	Ser	Val	Ala	
			980					985					990			
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Ile	Phe	Asn	Ser	Thr	Asp	Tyr	Pro	Ala	Ser	Gln	Arg	Asp	Met	Arg	Val	
	1010					1015					1020					

Gly	Val	Tyr	Gly	Ala	Leu	Gly	Leu	Ala	Gln	Gly	Ile	Phe	Val	Phe	Ile	1025	1030	1035	1040
Ala	His	Phe	Trp	Ser	Ala	Phe	Gly	Phe	Val	His	Ala	Ser	Asn	Ile	Leu	1045	1050	1055	
His	Lys	Gln	Leu	Leu	Asn	Asn	Ile	Leu	Arg	Ala	Pro	Met	Arg	Phe	Phe	1060	1065	1070	
Asp	Thr	Thr	Pro	Thr	Gly	Arg	Ile	Val	Asn	Arg	Phe	Ala	Gly	Asp	Ile	1075	1080	1085	
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Cys	Phe	Leu	Gly	Ile	Ile	Ser	Thr	Leu	Val	Met	Ile	Cys	Met	Ala	Thr	1105	1110	1115	1120
Pro	Val	Phe	Thr	Ile	Ile	Val	Ile	Pro	Leu	Gly	Ile	Ile	Tyr	Val	Ser	1125	1130	1135	
Val	Gln	Met	Phe	Tyr	Val	Ser	Thr	Ser	Arg	Gln	Leu	Arg	Arg	Leu	Asp	1140	1145	1150	
Ser	Val	Thr	Arg	Ser	Pro	Ile	Tyr	Ser	His	Phe	Ser	Glu	Thr	Val	Ser	1155	1160	1165	
Gly	Leu	Pro	Val	Ile	Arg	Ala	Phe	Glu	His	Gln	Gln	Arg	Phe	Leu	Lys	1170	1175	1180	
His	Asn	Glu	Val	Arg	Ile	Asp	Thr	Asn	Gln	Lys	Cys	Val	Phe	Ser	Trp	1185	1190	1195	1200
Ile	Thr	Ser	Asn	Arg	Trp	Leu	Ala	Ile	Arg	Leu	Glu	Leu	Val	Gly	Asn	1205	1210	1215	
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Leu	Ser	Gly	Asp	Thr	Val	Gly	Phe	Val	Leu	Ser	Asn	Ala	Leu	Asn	Ile	1235	1240	1245	
Thr	Gln	Thr	Leu	Asn	Trp	Leu	Val	Arg	Met	Thr	Ser	Glu	Ile	Glu	Thr	1250	1255	1260	
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Glu	Ala	Pro	Trp	Val	Thr	Asp	Lys	Arg	Pro	Pro	Pro	Asp	Trp	Pro	Ser	1285	1290	1295	
Lys	Gly	Lys	Ile	Gln	Phe	Asn	Asn	Tyr	Gln	Val	Arg	Tyr	Arg	Pro	Glu	1300	1305	1310	
Leu	Asp	Leu	Val	Leu	Arg	Gly	Ile	Thr	Cys	Asp	Ile	Gly	Ser	Met	Glu	1315	1320	1325	
Lys	Ile	Gly	Val	Val	Gly	Arg	Thr	Gly	Ala	Gly	Lys	Ser	Ser	Leu	Thr	1330	1335	1340	
Asn	Cys	Leu	Phe	Arg	Ile	Leu	Glu	Ala	Ala	Gly	Gly	Gln	Ile	Ile	Ile	1345	1350	1355	1360
Asp	Gly	Val	Asp	Ile	Ala	Ser	Ile	Gly	Leu	His	Asp	Leu	Arg	Glu	Lys	1365	1370	1375	
Leu	Thr	Ile	Ile	Pro	Gln	Asp	Pro	Ile	Leu	Phe	Ser	Gly	Ser	Leu	Arg	1380	1385	1390	
Met	Asn	Leu	Asp	Pro	Phe	Asn	Asn	Tyr	Ser	Asp	Glu	Glu	Ile	Trp	Lys	1395	1400	1405	
Ala	Leu	Glu	Leu	Ala	His	Leu	Lys	Ser	Phe	Val	Ala	Ser	Leu	Gln	Leu	1410	1415	1420	
Gly	Leu	Ser	His	Glu	Val	Thr	Glu	Ala	Gly	Gly	Asn	Leu	Ser	Ile	Gly	1425	1430	1435	1440
Gln	Arg	Gln	Leu	Leu	Cys	Leu	Gly	Arg	Ala	Leu	Leu	Arg	Lys	Ser	Lys	1445	1450	1455	
Ile	Leu	Val	Leu	Asp	Glu	Ala	Thr	Ala	Ala	Val	Asp	Leu	Glu	Thr	Asp	1460	1465	1470	
Asn	Leu	Ile	Gln	Thr	Thr	Ile	Gln	Asn	Glu	Phe	Ala	His	Cys	Thr	Val				

1475	1480	1485
Ile Thr Ile Ala His Arg Leu His Thr Ile Met Asp Ser Asp Lys Val		
1490	1495	1500
Met Val Leu Asp Asn Gly Lys Ile Ile Glu Cys Gly Ser Pro Glu Glu		
1505	1510	1515
Leu Leu Gln Ile Pro Gly Pro Phe Tyr Phe Met Ala Lys Glu Ala Gly		
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Ile Glu Asn Val Asn Ser Thr Lys Phe		1535
1540	1545	

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 <212> DNA
 <213> Homo sapiens

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 <212> DNA
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 ttttatgcaa caggaagcat aataggagat ataagacaag cacattgtaa ccttagtaga 180
 acacaatgga ataacacttt agaacagata gttaaaaaat taagagaaca atttaaaaat 240
 aaaacaatag cttttaagca c 261

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 <212> DNA
 <213> Homo sapiens

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 ttaatttctg gaaaagaagc ctaacttggt cactacatag tcgtccttct tcctctctgg 180
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 <211> 490
 <212> DNA

<213> Homo sapiens

<400> 6

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ttaatttctg gaaaagaagc ctaacttggt cactacatag tcgtccttct tcctctctgg 180
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gcctattaag aaacctaata aagctccacc ttcttttatct ctgaaagtga actccctgct 360
acctttgtgg actgacagct ttttatagtc acgtgacaca gtcaaacatt aacttggtgt 420
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<210> 7

<211> 492

<212> DNA

<213> Homo sapiens

<400> 7

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ttaatttttg gaaaagaagc ctaacttggt cactacatag tcgtccttct tcctctctgg 180
taacacttgt tgggtctgtg aaataactaat ttaatggatc ctgagggttct ggaagtactt 240
tgctgtgttc actcaagaat gtgatttgag tatgaaattc cagccagttc aactgttggt 300
gcctattaag aaacctaata aagctccacc ttcttttatct ctgaaagtga actccctgct 360
acctttgtgg actgacagct ttttatagtc acgtgacaca gtcaaacatt aacttggtgt 420
atcgattggg ttttgccata tatatatata tataagtagg agagggcgaa cctctggcag 480
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<210> 8

<211> 494

<212> DNA

<213> Homo sapiens

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ttaatttttg gaaaagaagc ctaacttggt cactacatag tcgtccttct tcctctctgg 180
taacacttgt tgggtctgtg aaataactaat ttaatggatc ctgagggttct ggaagtactt 240
tgctgtgttc actcaagaat gtgatttgag tatgaaattc cagccagttc aactgttggt 300
gcctattaag aaacctaata aagctccacc ttcttttatct ctgaaagtga actccctgct 360
acctttgtgg actgacagct ttttatagtc acgtgacaca gtcaaacatt aacttggtgt 420
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<211> 2830

<212> DNA

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<220>

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tctatatattc aatc atg gac caa aat caa cat ttg aat aaa aca gca gag 170
Met Asp Gln Asn Gln His Leu Asn Lys Thr Ala Glu
1 5 10

gca caa cct tca gag aat aag aaa aca aga tac tgc aat gga ttg aag 218
Ala Gln Pro Ser Glu Asn Lys Lys Thr Arg Tyr Cys Asn Gly Leu Lys
15 20 25

atg ttc ttg gca gct ctg tca ctc agc ttt att gct aag aca cta ggt 266
Met Phe Leu Ala Ala Leu Ser Leu Ser Phe Ile Ala Lys Thr Leu Gly
30 35 40

gca att att atg aaa agt tcc atc att cat ata gaa cgg aga ttt gag 314
Ala Ile Ile Met Lys Ser Ser Ile Ile His Ile Glu Arg Arg Phe Glu
45 50 55 60

ata tcc tct tct ctt gtt ggt ttt att gac gga agc ttt gaa att gga 362
Ile Ser Ser Ser Leu Val Gly Phe Ile Asp Gly Ser Phe Glu Ile Gly
65 70 75

aat ttg ctt gtg att gta ttt gtg agt tac ttt gga tcc aaa cta cat 410
Asn Leu Leu Val Ile Val Phe Val Ser Tyr Phe Gly Ser Lys Leu His
80 85 90

aga cca aag tta att gga atc ggt tgt ttc att atg gga att gga ggt 458
Arg Pro Lys Leu Ile Gly Ile Gly Cys Phe Ile Met Gly Ile Gly Gly
95 100 105

gtt ttg act gct ttg cca cat ttc ttc atg gga tat tac agg tat tct 506
Val Leu Thr Ala Leu Pro His Phe Phe Met Gly Tyr Tyr Arg Tyr Ser
110 115 120

aaa gaa act aat atc gat tca tca gaa aat tca aca tcg acc tta tcc 554
Lys Glu Thr Asn Ile Asp Ser Ser Glu Asn Ser Thr Ser Thr Leu Ser
125 130 135 140

act tgt tta att aat caa att tta tca ctc aat aga gca tca cct gag 602
Thr Cys Leu Ile Asn Gln Ile Leu Ser Leu Asn Arg Ala Ser Pro Glu
145 150 155

ata gtg gga aaa ggt tgt tta aag gaa tct ggg tca tac atg tgg ata 650
Ile Val Gly Lys Gly Cys Leu Lys Glu Ser Gly Ser Tyr Met Trp Ile
160 165 170

tat gtg ttc atg ggt aat atg ctt cgt gga ata ggg gag act ccc ata 698
Tyr Val Phe Met Gly Asn Met Leu Arg Gly Ile Gly Glu Thr Pro Ile
175 180 185

gta cca ttg ggg ctt tct tac att gat gat ttc gct aaa gaa gga cat 746
Val Pro Leu Gly Leu Ser Tyr Ile Asp Asp Phe Ala Lys Glu Gly His
190 195 200

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Ser	Ser	Leu	Tyr	Leu	Gly	Ile	Leu	Asn	Ala	Ile	Ala	Met	Ile	Gly	Pro	
205					210					215					220	
atc	att	ggc	ttt	acc	ctg	gga	tct	ctg	ttt	tct	aaa	atg	tac	gtg	gat	842
Ile	Ile	Gly	Phe	Thr	Leu	Gly	Ser	Leu	Phe	Ser	Lys	Met	Tyr	Val	Asp	
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Ile	Gly	Tyr	Val	Asp	Leu	Ser	Thr	Ile	Arg	Ile	Thr	Pro	Thr	Asp	Ser	
			240					245					250			
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Arg	Trp	Val	Gly	Ala	Trp	Trp	Leu	Asn	Phe	Leu	Val	Ser	Gly	Leu	Phe	
		255					260					265				
tcc	att	att	tct	tcc	ata	cca	ttc	ttt	ttc	ttg	ccc	caa	act	cca	aat	986
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